

WHAT IS CLAIMED IS:

1. A foamable alcohol composition, comprising;
 - a) a C₁₋₄ alcohol, or mixtures thereof, present in an amount greater than about 40% v/v of the total composition;
 - b) an effective physiologically acceptable silicone-based surface active agent, which includes a lipophilic chain containing a silicone backbone ($-(R_2Si-O)_n-$), for wetting and foaming present in an amount of at least 0.01% weight percent of the total composition; and
 - c) water present in an amount to balance the total composition to 100% weight percent.
2. The composition according to claim 1 wherein the composition is foamable when mixed with air at low pressure, wherein when the composition is mixed with air, the mixture of the composition and air forms a foam.
3. The composition according to claims 1 or 2 wherein the effective silicone-based surface active agent for wetting and foaming is physiologically compatible, and wherein the silicone-based surfactant is selected from the group consisting of silicone ethoxylates, silicone glycerol esters, silicone amine oxides, silicone acetylenic alcohol derivatives, silicone carboxylates, silicone sulphates, silicone phosphates, silicone Imidazole quats, silicone Amino Quats, silicone phosphate esters, silicone carbohydrate derivatives, silicone Isethionates, silicone sulfonates, silicone betaines, silicone Alkyl

Quats, silicone Amino propionates, silicone esters, silicone polyamides, silicone fluorinated surfactants, and silicone hydrocarbon surfactants.

4. The composition according to claim 1, 2 or 3 wherein the effective silicone-based surface active agent is a physiologically acceptable silicone-based surface active agent selected from the group consisting of Bis-PEG-[10-20] dimethicones, 3-(3-Hydroxypropyl)-heptamethyltrisiloxane, ethoxylated, acetate, polyether-modified polysiloxanes, polysiloxane betaine and mixtures thereof from about 0.01% to about 10.0% weight percent of the total composition.
5. The composition according to claim 1, 2, 3 or 4 wherein the alcohol C₁₋₄ is an aliphatic alcohol selected from the group consisting of methanol, ethanol, isopropanol, n-propanol, butanol and combinations thereof.
6. The composition according to claim 1, 2, 3, 4 or 5 wherein the silicone-based surface active agent is selected from the group consisting of Bis-PEG-12 dimethicone, Bis-PEG-17 Dimethicone, Bis-PEG-20 Dimethicone and combinations thereof.
7. The composition according to claim 1, 2, 3, 4 or 5 wherein the silicone-based surfactant is a 3-(3-Hydroxypropyl)-heptamethyltrisiloxane,
8. The composition according to claim 1, 2, 3, 4 or 5 wherein the silicone-based surfactant is a polyether-modified polysiloxane

9. The composition according to claim 1, 2, 3, 4 or 5 wherein the silicone-based surfactant is a polysiloxane betaine.
10. The composition according to claim 1, 2, 3, 4 or 5 wherein the silicone-based surfactant is a mixture of two or more of the silicone-based surfactants in claims 6, 7, 8 and 9.
11. The composition according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10 wherein the alcohol is present in a range from about 40 % to about 90 % v/v.
12. The composition according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10 wherein the alcohol is ethanol present in an amount of at least 60% v/v, and wherein the composition is for use as an alcohol foam for personal hygiene.
13. The composition according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10 wherein the alcohol is a mixture of n-propanol and ethanol present in a combined amount of at least 60% v/v, and wherein the composition is for use as an alcohol foam for personal hygiene.
14. The composition according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10 wherein the alcohol is a mixture of isopropanol and ethanol present in a combined amount of at least 60% v/v, and wherein the composition is for use as an alcohol foam for personal hygiene.
15. The composition according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10 wherein the alcohol is isopropanol present in an amount of at least 70% v/v,

and wherein the composition is for use as an alcohol foam for personal hygiene.

16. The composition according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10 wherein alcohol is n-propanol present in an amount of at least 60% v/v, and wherein the composition is for use as an alcohol foam for personal hygiene.

17. The composition according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 or 16 further including at least one additional surfactant for adjusting properties of the foam produced from the composition.

18. The composition according to claim 17 wherein the additional surfactant is selected from the group consisting of additional silicone-based surface active agents, fluorinated surfactants, alkylglucosides, poly(ethoxylated and/or propoxylated)alcohol, a poly(ethoxylated and/or propoxylated)ester, a derivative of a poly(ethoxylated and/or propoxylated)alcohol, a derivative of a poly(ethoxylated and/or propoxylated)ester, an alkyl alcohol, an alkenyl alcohol, an ester of a polyhydric alcohol, an ether of a polyhydric alcohol, an ester of a polyalkoxylated derivative of a polyhydric alcohol, an ether of a polyalkoxylated derivative of a polyhydric alcohol, a sorbitan fatty acid ester, a polyalkoxylated derivative of a sorbitan fatty acid ester, a betaine, a sulfobetaine, an imidazoline derivative, an aminoacid derivative, a lecithin, a phosphatide, an amine oxide, a sulfoxide and mixtures thereof, present in an amount between about 0.10 % to about 5% weight percent.

19. The composition according to claim 18 wherein the betaine is cocamidopropyl betaine.
20. The composition according to claim 19 wherein the alkylglucoside is cocoglucoside.
21. The composition according to claim 18 wherein the polyethoxylated fatty alcohol is polyethoxylated stearyl alcohol (21 moles ethylene oxide).
22. The composition according to claim 18 wherein the polyethoxylated fatty alcohol is polyethoxylated stearyl alcohol (2 moles ethylene oxide).
23. The composition according to claim 18 wherein the polyethoxylated fatty alcohol is a combination of polyethoxylated stearyl alcohol (21 moles ethylene oxide) and polyethoxylated stearyl alcohol (2 moles ethylene oxide).
24. The composition according to claim 18 wherein said fluorinated surfactant is DEA C[8-18] perfluoroalkylethyl phosphate.
25. The composition according to claim 18 wherein said fluorinated surfactant is ammonium C[6-16] perfluoroalkylethyl phosphate.

26. The composition according to claim 1, 2, 3, 4 or 5 wherein the silicone-based surface active agent is 3-(3-Hydroxypropyl)-heptamethyltrisiloxane, ethoxylated, acetate.

27. The composition according to any one of claims 1 to 26 including a foam stabilizing agent present in an amount up to about 10%.

28. The composition according to claim 27 wherein the foam stabilizing agent is selected from the group consisting of lactic acid esters of monoglycerides, cationic emulsifiers, quaternary ammonium compounds, triquaternized stearic phospholipid complex, hydroxystearamide propyltrimine salts, lactic acid monoglycerides, food emulsifiers such as glyceryl monostearate, propylene glycol monostearate, sodium stearyl lactylate, cetyl betaine, glycolether, n-propanol, butyleneglycol, silicone wax, an encapsulated oil, Microcapsule Mineral Oil, and combinations thereof.

29. The composition according to claim 27 wherein the foam stabilizing agent is selected from the group consisting of glycolether, glycerine, butyleneglycol, Behentrimonium chloride, or Cetrimonium Chloride and combinations thereof.

30. The composition according to any one of claims 1 to 29 including any one of a moisturizer, emollient, lipid layer enhancers and combinations thereof selected from the group consisting of lanolin, vinyl alcohol, polyvinyl pyrrolidone and polyols selected from the group consisting of glycerol,

propylene glycol, butyleneglycol, glyceryl oleate and sorbitol, cocoglucoside, a fatty alcohol selected from the group consisting of cetyl alcohol, stearyl alcohol, lauryl alcohol, myristyl alcohol and palmityl alcohol, cetyl alcohol, ceteareth 20, an alkylglucoside, mixtures of alkylglucoside and glyceryl Oleate, PEG-200 Hydrogenated Glyceryl Palmiate, Dihydroxypropyl PEG-5 Linoleammonium Chloride or PEG-7 Glyceryl Cocoate, and combinations thereof, present in an amount up to about 5%.

31. The composition according to any one of claims 1 to 30 further comprising an acid or a base to adjust a pH of the composition to a pre-selected pH present in an amount from about 0.05 to about 0.5 % weight percent of the total composition.

32. The composition according to claim 31 wherein when an acid is used to adjust the pH the acid is selected from the group consisting of hydrochloric acid, citric acid and phosphoric acid, and wherein when a base is used to adjust the pH the base is sodium sesquicarbonate.

33. The composition according to any one of claims 1 to 32 including a preservative in an amount from about 0.01 to about 5 % weight percent of the total composition.

34. The composition according to any one of claims 1 to 33 including an antimicrobial agent.

35. The composition according to claim 34 wherein the antimicrobial agent is selected from the group of chlorhexidine salts, iodine, complexed forms of iodine, parachlorometaxyleneol, triclosan, hexachlorophene, a phenol, a surfactant having a long chain hydrophobic group and a quaternary group, hydrogen peroxide, silver, a silver salt, silver oxide, behenyl alcohol, and mixtures thereof.

36. The composition according to claim 34 wherein the antimicrobial agent is chlorhexidine gluconate present in an amount between about 0.50 % to about 4.0 % weight percent.

37. The composition according to claim 34 wherein the antimicrobial agent is didecyl dimethyl diammonium chloride present in an amount between about 0.05 % to about 5.0 % weight percent.

38. The composition according to claim 34 wherein the antimicrobial agent is benzalkonium chloride present in an amount between about 0.05 % to about 5.0 % weight percent.

39. The composition according to claim 34 wherein the antimicrobial agent is behenyl alcohol present in an amount between about 0.05 % to about 5.0 % weight percent.

40. The composition according to any one of claims 1 to 39 further comprising constituents selected from the group consisting of organic gums

and colloids, lower alkanolamides of higher fatty acids, short chain diols and/or triols, fragrance, coloring matter, ultraviolet absorbers, solvents, suspending agents, buffers, conditioning agents, antioxidants, bactericides and medicinally active ingredients, and combinations thereof.

41. The composition according to any one of claims 1 to 40 stored in an unpressurized dispenser having a dispenser pump for mixing the composition with air and dispensing foam therefrom.

42. The composition according to any one of claim 1 to 40 stored in a pressurized dispenser having a dispenser pump for mixing the composition with air or a propellant and dispensing foam therefrom, the composition including an aerosol propellant in an amount from about 3 to about 20 weight percent of the total composition.

43. The composition according to claim 42 wherein the aerosol propellant is selected from the group consisting of propane, carbon dioxide butane, dichloro difluoro methane, dichloro tetra fluoro ethane octafluorocyclo butane; 1,1,1,2-tetrafluoroethane; 1,1,1,2,3,3,3 heptafluoropropane, and 1,1,1,3,3,3,-hexafluoropropane.

44. The composition according to claim 42 or 43 including a corrosion inhibitor is selected from the group consisting of sorbic acid, benzoic acid, potassium sorbate and sodium benzoate, in an amount from about 0.1 to about 5 weight percent of the total composition.

45. A composition concentrate, comprising;
- a) an effective silicone-based surface active agent, which includes a lipophilic chain containing a silicone backbone ($-(R_2Si-O)_n-$), for wetting and foaming present in an amount of at least 0.01% weight percent of the total composition 0.01 to about 15.0 %;
 - b) a foam stabilizing agent including at least from about 0.01 to about 10.0%;
 - c) one of moisturizers, emollients and combinations thereof present in a range from about 0.05% to about 5.0%; and
 - d) water.

46. The composition concentrate according to claim 45 wherein the effective silicone-based surface active agent is a physiologically acceptable Bis-PEG-20 dimethicone, Bis-PEG-17 dimethicone, Bis-PEG 12 dimethicone , a 3-(3-Hydroxypropyl)-heptamethyltrisiloxane, ethoxylated, acetate, a Polyether-modified polysiloxane or a Polysiloxane betaine, or mixtures thereof

47. The composition concentrate according to claim 45 or 46 wherein the foam stabilizing agent is selected from the group consisting of glycerine, cetrimonium chloride, behentrimonium chloride and combinations thereof.

48. The composition concentrate according to claim 45, 46 or 47 wherein the moisturizers and emollients include cocoglucoside, and glyceryl oleate, or PEG-200 Hydrogenated glyceryl palmitate, or Dihydroxypropyl PEG-5

linoleammonium Chloride or PEG-7 Glyceryl Cocoate, and combinations thereof, present in an amount up to 5%.

49. The composition concentrate according to claim 45, 46, 47 or 48 which is constituted as an alcohol disinfecting composition by adding

a) an alcohol C₁₋₄, or mixtures thereof, present in an amount between about 60 % v/v to about 80% v/v of the total composition;

b) water present in an amount to balance the total composition to 100% weight percent.

50. The composition concentrate according to claim 49 wherein the alcohol C₁₋₄ is selected from the group consisting of ethanol, n-propanol, isopropanol and combinations thereof.

51. The composition concentrate according to any one of claims 45 to 50 made by a process of mixing the constituents and then warming the concentrate to a temperature between about 30 to about 80 degrees Celsius prior to shipping the concentrate.

52. An alcohol disinfecting composition, comprising;

a) a) an alcohol C₁₋₄, or mixtures thereof, present in an amount between about 60% to about 80% v/v of the total composition;

b) an effective physiologically acceptable silicone-based surface active agent, which includes a lipophilic chain containing a silicone backbone

($-(R_2Si-O)_n-$), for wetting and foaming present in an amount from about 0.01% to about 10.0% weight percent of the total composition;

c) a foam stabilizing agent present in an amount from about 0.01 to about 12.0 % weight percent;

d) any one of moisturizers, emollients and combinations thereof present in an amount from about 0.05 to about 5.0 % weight percent; and

e) water in an amount to balance the total composition to 100% weight percent.

53. The alcohol disinfecting composition according to claim 52 including air, wherein when the disinfecting composition is mixed with air, the mixture of disinfecting composition and air forms a foam.

54. The composition according to claims 52 or 53 wherein the effective silicone-based surface active agent for wetting and foaming is physiologically compatible, and wherein the silicone-based surfactant is selected from the group consisting of silicone ethoxylates, silicone glycerol esters, silicone amine oxides, silicone acetylenic alcohol derivatives, silicone carboxylates, silicone sulphates, silicone phosphates, silicone Imidazole quats, silicone Amino Quats, silicone phosphate esters, silicone carbohydrate derivatives, silicone Isethionates, silicone sulfonates, silicone betaines, silicone Alkyl Quats, silicone Amino propionates, silicone esters, silicone polyamides, silicone fluorinated surfactants, and silicone hydrocarbon surfactants.

55. The alcohol disinfecting composition according to claims 52 or 53 wherein the silicone-based surfactant is Bis-PEG-20 dimethicone.

56. The alcohol disinfecting composition according to claims 52 or 53 wherein the silicone-based surfactant is Bis-PEG-17 dimethicone.

57. The alcohol disinfecting composition according to claims 52 or 53 wherein the silicone-based surfactant is Bis-PEG-12 dimethicone.

58. The alcohol disinfecting composition according to claim 52 or 53 wherein the silicone-based surfactant is a 3-(3-Hydroxypropyl)-heptamethyltrisiloxane, ethoxylated, acetate,

59. The alcohol disinfecting composition according to claim 52 or 53 wherein the silicone-based surfactant is a Polyether-modified polysiloxane

60. The alcohol disinfecting composition according to claims 52 or 53 wherein the silicone-based surfactant is a Polysiloxane betaine.

61. The composition according to claims 52 or 53 wherein the silicone-based surfactant is a mixture of two or more of the silicone-based surfactants in claims 55 through 60.

62. The alcohol disinfecting composition according to any one of claims 52 to 61 wherein the foam stabilizing agent is selected from the group consisting

of lactic acid esters of monoglycerides, cationic emulsifiers, triquaternized stearic phospholipid complex, hydroxystearamide propyltriamine salts, lactic acid monoglycerides, food emulsifiers such as glyceryl monostearate, propylene glycol monostearate, sodium stearyl lactylate, silicone wax, quaternary ammonium chlorides an encapsulated oil, Microcapsule Mineral Oil, butyleneglycol, and mixtures thereof.

63. The alcohol disinfecting composition according to any one of claims 52 to 62 wherein the foam stabilizing agent is selected from the group consisting of 2-butoxyethanol, glycerine butyleneglycol, Cetrimonium chloride, and or Behentrimonium chloride and combinations thereof.

64. The alcohol disinfecting composition according to claims 52 through 62 including any one of a moisturizer, emollient and combinations thereof selected from the group consisting of lanolin, vinyl alcohol, polyvinyl pyrrolidone and polyols selected from the group consisting of glycerol, propylene glycol, butyleneglycol and sorbitol, or a fatty alcohol selected from the group consisting of cetyl alcohol, stearyl alcohol, lauryl alcohol, myristyl alcohol and palmityl alcohol, cetyl alcohol, cetareth 20, or an alkylglucoside and combinations thereof, present in an amount up to 5%.

65. The alcohol disinfecting composition according to claim 52 through 62 including a moisturizer and an emollient selected from the group consisting of glyceryl oleate, glycerine, cocoglucoside, or PEG-200 Hydrogenated Glyceryl Palmiate, or Dihydroxypropyl PEG-5 Linoleammonium Chloride or PEG-7

Glyceryl Cocoate.combinations thereof, present in an amount up to 5%.and combinations thereof.

66. The alcohol disinfecting composition according to any one of claims 52 to 62 including an antimicrobial agent.

67. The alcohol disinfecting composition according to claim 66 wherein the antimicrobial agent is selected from the group of a chlorhexidine salt, iodine, a complexed form of iodine, parachlorometaxyleneol, triclosan, hexachlorophene, a phenol, a surfactant having a long chain hydrophobic group and a quaternary group, hydrogen peroxide, silver, a silver salt, silver oxide, and mixtures thereof.

68. The alcohol disinfecting composition according to claim 66 wherein the antimicrobial agent is chlorhexidine gluconate present in an amount between about 0.50 % to about 4.0 % weight percent.

69. The alcohol disinfecting composition according to claim 66 wherein the antimicrobial agent is Didecyl Dymethyl Diamonium Chloride present in an amount between about 0.50 % to about 5.0 % weight percent.

70. The alcohol disinfecting composition according to claim 66 wherein the antimicrobial agent is Benzalkonium Chloride present in an amount between about 0.50 % to about 5.0 % weight percent.

71. The alcohol disinfecting composition according to claim 66 wherein the antimicrobial agent is Behenyl Alcohol present in an amount between about 0.50 % to about 5.0 % weight percent.

72. The alcohol disinfecting composition according to any one of claims 52 to 71 including a preservative in an amount from about 0.01 to about 5 % weight percent of the total composition.

73. The alcohol disinfecting composition according to any one of claims 52 to 71 including a preservative in an amount from about 0.01 to about 5 % weight percent of the total composition.

74. The alcohol disinfecting composition according to any one of claims 52 to 71 further comprising an acid or a base to adjust a pH of the disinfecting composition to a pre-selected pH present in an amount from about 0.05 to about 0.5 % weight percent of the total composition.

75. The alcohol disinfecting composition according to claim 74 wherein the acid is selected from the group consisting of hydrochloric acid, citric acid and phosphoric acid, and the base is sodium sesquicarbonate.

76. The alcohol disinfecting composition according to any one of claims 52 to 71 stored in an unpressurized dispenser having a dispenser pump for mixing the disinfecting composition with air and dispensing foam therefrom.

77. The alcohol disinfecting composition according to any one of claims 52 to 71 stored in a pressurized dispenser having a dispenser pump for mixing the disinfecting composition with air or a propellant and dispensing foam therefrom, the disinfecting composition including an aerosol propellant in an amount from about 3 to about 20 weight percent of the total composition.

78. The alcohol disinfecting composition according to claim 52 wherein the aerosol propellant is selected from the group consisting of propane, carbon dioxide, butane, dichloro difluoro methane, dichloro tetra fluoro ethane octafluorocyclo butane; 1,1,1,2-tetrafluoroethane; 1,1,1,2,3,3,3 heptafluoropropane, and 1,1,1,3,3,3,-hexafluoropropane.

79. The alcohol disinfecting composition according to claim 77 or 78 including a corrosion inhibitor is selected from the group consisting of sorbic acid, benzoic acid, potassium sorbate and sodium benzoate, in an amount from about 0.1 to about 5 weight percent of the total composition.

80. The alcohol disinfecting composition according to any one of claims 52 to 79 including any one of a moisturizer, emollient and combinations thereof selected from the group consisting of lanolin, vinyl alcohol, polyvinyl pyrrolidone and polyols selected from the group consisting of glycerol, propylene glycol, butyleneglycol and sorbitol, or a fatty alcohol selected from the group consisting of cetyl alcohol, stearyl alcohol, lauryl alcohol, myristyl alcohol and palmityl alcohol, cetyl alcohol, cetareth 20, or an alkylglucoside or PEG-200 Hydrogenated Glyceryl Palmiate, or Dihydroxypropyl PEG-5

Linoleammonium Chloride or PEG-7 Glyceryl Cocoate combinations thereof, present in an amount up to 5% and combinations thereof.

81. The alcohol disinfecting composition according to any one of claims 52 to 79 further comprising other constituents or materials including organic gums and colloids, lower alkanolamides of higher fatty acids, short chain diols and/or triols, fragrance, coloring matter, additional emollients, ultraviolet absorbers, solvents, emulsifiers, foam stabilizers or mixture of such stabilizers, suspending agents, buffers, conditioning agents, antioxidants, bactericides, medicinal active ingredient, and the like) that may be commonly added to aerosol compositions, toiletries, cosmetics and pharmaceuticals.

82. The composition according to any one of claims 1 to 44 further comprising a physiologically acceptable fluorosurfactant present in a range from about 0.01 to about 10%w/w, wherein said C₁₋₄ alcohol is present in an amount from about 40 to about 90 v/v of the total composition, and wherein the silicone-based surface active agent for wetting and foaming present in an amount from about 0.1 to about 10%w/w weight percent of the total composition.

83. The composition according to claim 82 wherein the fluorosurfactant is selected from the group consisting of fluorinated ethoxylates, glycerol esters, amine oxides, acetylenic alcohol derivatives, carboxylates, phosphates, carbohydrate derivatives, sulfonates, betaines, esters, polyamides, silicones, and hydrocarbon surfactants.

84. The composition according to claim 82 or 83 wherein the fluorosurfactant is an amphoteric polytetrafluoroethylene acetoxyparyl betaine $(\text{CF}_3\text{CF}_2(\text{CF}_2\text{CF}_2)_n\text{CH}_2\text{CH}_2(\text{OAc})\text{CH}_2\text{N}^+(\text{CH}_3)_2\text{CH}_2\text{COO}^-)$ where $n = 2$ to 4.

85. The composition according to claim 82 or 83 wherein the fluorosurfactant is an ethoxylated nonionic fluorosurfactant of the following structure: $\text{RfCH}_2\text{CH}_2\text{O}(\text{CH}_2\text{CH}_2\text{O})_x\text{H}$ where $\text{Rf} = \text{F}(\text{CF}_2\text{CF}_2)_y$, $x = 0$ to about 15, and $y = 1$ to about 7.

86. The composition according to claims 82 or 83 wherein the fluorosurfactant is an anionic phosphate fluorosurfactant of the following structure: $(\text{RfCH}_2\text{CH}_2\text{O})_x\text{P}(\text{O})(\text{ONH}_4)_y$ where $\text{Rf} = \text{F}(\text{CF}_2\text{CF}_2)_z$, $x = 1$ or 2, $y = 2$ or 1, $x + y = 3$, and $z = 1$ to about 7 or mixtures thereof.

87. A method of forming a foam using a composition according to any one of claims 1 to 44, by storing said composition in a container and having a dispenser pump activating the dispenser pump to mix the alcohol and silicone-based surface active agent mixture with air under low pressure to form a low pressure foam containing alcohol which is dispensed from said dispenser.